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Does the Internet Kill the Distance? Evidence from Navigation, E-commerce, and E-banking[*]

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Abstract
By diminishing the cost of performing isolated economic activities in isolated areas, information technology might serve as a substitute for urban agglomeration. This paper assesses this hypothesis by using Italian household level data on internet navigation, e-commerce, and e-banking. Empirically, I find no support for the argument that the internet reduces the role of distance. My results suggest that: (1) Internet navigation is more frequent for urban consumers than their non-urban counterparts. (2) The use of e-commerce is basically not affected by the size of the city where the household lives. Remote consumers are discouraged by the fact that they cannot see the goods before buying them. Leisure activities and cultural items are the only goods and services for which e-commerce is used more intensively in isolated areas. (3) E-banking bears no relationship with city size. In choosing a bank, non-urban customers evaluate personal acquaintances as an important factor more intensively than urban clients. This also depends on the fact that banking account holders in remote areas are more frequently supplied with a loan by their bank.

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1. Introduction

A common assertion is that the Internet might reduce the importance of distance for economic activity. By diminishing the cost of performing isolated economic activities in isolated areas, the Internet might serve as a substitute for urban agglomeration. In this paper, I label this assertion the "Internet Kills the Distance" (IKD) hypothesis.[1]

Toffler (1980) and Naisbitt (1995), were the firsts who observed the rapid pace of diffusion of information technology and, on this basis, forecasted the end of the need for cities. The basic idea is that cities lower the costs of transporting goods and sharing ideas. Because the information technology, too, lowers the costs of transportation and of communication, it might replace some traditional functions of cities. In a similar vein, Gilder (1995) pointed out that the Internet should boost the fortunes of small cities and rural areas more than those of larger cities. In short, Internet users might reap some of the advantages offered in cities without having to locate there. Among the proponents of the IKD hypothesis, Cairncross (1997) is the most emphatic example, as she points out that the death of distance will be the single most important economic force shaping all of society over the next half a century.

Not long after the first enthusiastic wave on the strength of the IKD hypothesis, many economists started to realize that the diffusion of Internet-related possibilities could not necessarily imply a diminished role of distance.[2] Gaspar and Glaeser (1998) noted that the IKD hypothesis might not apply when the Internet connects two parties, such as by e-mail or match-making sites. They argue that any given two-party interaction can take place either electronically or face-to face. However, if some relationships involve both electronic and face-to-face interactions, then a decrease in the cost of electronic communication due to the Internet raises the overall level of interactions, a fraction of which will take place face-to-face. While the Gaspar and Glaeser (1998) argument does not apply for one-party Internet connections, as the navigation aimed at information acquisition, Sinai and Waldfogel (2004) show that also in this case the IKD hypothesis could be undermined. They stress that the supply of Internet content is biased in favor of urban residents. Larger markets have more locally-targeted content than smaller markets, since the Internet provides disproportionately information that is more valuable for city residents (for instance, information related to events, restaurant and movie listing or local news).

In principle, e-commerce and e-banking could represent a more promising ground for the IKD hypothesis. For both activities there seems to be a clear advantage for geographically remote consumers. A person who has no store nearby can instead buy online. Similarly, an isolated person can skip a costly branch visit by using e-banking.[3] In short, there is a clear presumption that the distance to the closest retailer or bank branch is an important determinant of the use of e-commerce and e-banking. Nonetheless, important shortcomings remain.

Exploiting the advantages of e-commerce presupposes that buyers are familiar with the range of products they can easily make choice from only electronically-provided information. As noted by Borenstein and Saloner (2001), this represents a dubious when issues of fit, touch, taste, and smell are issues. Culture and infrastructures might provide

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[1] Note that the IKD hypothesis has been variously labeled in the literature. Examples are the *global village* hypothesis, the *death of distance* hypothesis, the *death of cities* hypothesis, and the *Internet-cities substitution* hypothesis.

[2] As Ellison and Ellison (2005, p. 139) put it: "Many of us has grown used to, tired of, ad finally downright skeptical of claims of the transformative powers of the Internet."

[3] Transport cost savings do not represent the only benefits for remote consumers. Savings on search costs (Ellison and Ellison (2005)) and variety costs (Gehring (1998) and Waldfogel (2003)) represent additional sources of gains.

additional impediments. Lack of knowledge about the possibilities offered by the web or inefficiency in the parcel-delivery might discourage online spending in remote areas, as a good cultural climate and high-quality support services can be more readily available in urban settings.

Financial transactions are probably the most important examples of transactions where no physical product is involved. Therefore, the impact of distance on e-banking should be apparent. However, exploiting the possibilities offered by e-banking also runs into limitations. For instance, some financial services might be not available on the web and therefore a trip to the closest branch is necessary anyway. If this is the case, then consumption economies for one-stop banking (Berger et al (1996)) might totally discourage the use of the Internet. On the other hand, information about families and small family business is thought to be soft or tacit (Petersen (2004)), that is hard to communicate to others. As noted by Petersen and Rajan (2002), lending practices based on soft information require the lender to have personal contacts with the borrower. In this case, a borrower from a given bank might want to stick with the same bank for the additional financial services she needs. For instance, Berlin and Mester (1999) show that the information generated by a deposit account may increase the probability of obtaining good terms on loans.

There is relatively little work examining geographic variation in Internet usage, e-commerce and e-banking. Because of the lack of appropriate data, most of this work is based on the U.S. case, for which data availability is higher. Kolko (2000) is a first attempt of studying the IKD hypothesis. He uses data on commercial internet domain (.doc) registration at the county-level and finds that domain density is higher in larger cities. He also finds, however, that the IKD hypothesis receives some support, insofar more isolated cities also display higher domain registration. Still with a focus on commercial Internet, Forman et al (2006) use firm-level data and find that whether or not the IKD hypothesis is confirmed by data, depends on the level of usage. While simple applications (such as emails and browsing) are more likely in rural areas than in urban areas, the opposite is true for more complex tasks, such as e-commerce. Closer to the point of this paper, which focuses on household behavior, Sinai and Waldfogel (2004) examine household-level data and estimate that the probability of having an Internet connection at home bears no relation with city size. They also provide evidence, however, that, controlling for a measure of the local Internet content, connections in urban areas are less frequent. With a focus on financial transactions, Bonaccorsi di Patti et al (2005) study whether banks tend to expand in the e-business more in the local markets where they have fewer branches and find some supportive evidence. On the demand side, Kahn (2004) tests whether consumer adoption of online banking is affected by the distance to one's bank branch and fails to find any significant effect. Interesting, Kahn (2004) finds that the type of financial account that a consumer has with her bank is a significant predictor of online banking usage (however, he does not have data on the loans supplied by the bank).

In this paper I use information on Italian households to check whether the IKD hypothesis receives empirical support. I start by studying the likelihood of Internet navigation for households located in areas of varying size. I find that the relation between city size and the probability of using the internet is increasing, rather than decreasing as the IKD hypothesis would suggest. I also find that Internet navigation is strongly correlated with the income and the education of the household. The positive correlation between city size and Internet use is robust: it is unlikely to be driven by spatially correlated omitted variables; it is not due to spatial sorting; it survives when the city size is treated as endogenous variables and instrumented. Then, I move to e-commerce. I show that the use of e-commerce is basically not affected by the size of the city where the household lives. Remote consumers are discouraged by the fact that they cannot see the goods before buying them. Leisure activities and cultural items are the only goods and services for which

e-commerce supports the IKD hypothesis. Finally, I find that e-banking bears no relationship with city size. In choosing a bank, non-urban customers evaluate personal acquaintances as an important factor more intensively than urban clients. This is consistent with theories that stress the role of soft information in lending practices to families and family businesses, as non-urban clients are more frequently supplied with a loan by their bank.

The paper is structured as follows. Next section illustrates the data. Section 3 presents the econometric results. The final section concludes.

2. Data

The main data source is the Survey of Household Income and Wealth (SHIW). This survey is conduced every two years by the Bank of Italy on a representative sample of about 8,000 households: see Brandolini and Cannari (1994) for details.[4] The SHIW collects detailed information on Italian households, such as age and education of each member, and family income. An important feature of the SHIW is the fact that the *standard* information on demographic and economic aspects, which are recorded regularly every wave and are similar to those collected by other surveys such as the American PSID or CPS, are supplemented by special sections. Below, I exploit the 2002 wave of the survey, which include a special section on information technology. The dataset includes 8,011 observations. [5] Table 1 gives the means and standard deviations for all the measures of IT adoption, which are the dependent variables in our regressions, as well as the other main variables used in the paper (the description of the variables is in the Appendix). For the 75% of the household interviewed, there is at least one member of the family that navigates in Internet. The use of e-commerce and e-banking is however much less widespread. Only 15% of the households in our sample have both the year of the survey goods and services via Internet. Only 5% of the households have used e-banking.

Households are distributed over 344 cities. From the 2001 Census of Population of the National Statistical Institute (ISTAT), I take the measures for city size. In addition to the city population and the log of the city population, I also make use of a series of dummies, one for each of the following categories: Villages (up to 20,000 inhabitants); Small Cities (from 20,000 to 40,000 inhabitants); Midsize Cities (from 40,000 to 500,000 inhabitants); and Large Cities (more than 500,000 inhabitants). The 8,011 households of our sample are distributed over the city size range as follows: 29% live in Villages; 18% in Small Cities; 44% in Midsize Cities; and 8% in Large Cities. For the IV estimation, I use the ISTAT total city land as instrument for the city population. All regressions are based on appropriate weighted data.[6]

3. Results

3.1 Internet navigation

[4] SHIW micro-data are publicly available at www.bancaditalia.it.
[5] The special sections are considered to be quite demanding for the respondents and very expensive for the Bank of Italy. This explains why sometimes the questions included in a special section are posed only to a subset of the respondents.
[6] Our coefficient estimates however are not sensitive to weighting or not weighting the data.

I start by studying how geography impacts on Internet navigation. Table 2 reports the probit estimates of the effects of the city size on the probability of navigating in Internet for a sample of 3,009 households. I first regress (Column 1) the indicator of Internet use on the level of city population, controlling by nothing else than geographic dummies for the Italian macro-regions, respectively North, Center, and South and Islands. This inclusion is warranted. As is well known, the macro-regions differ in a number of respects. For instance, the South is generally poorer and less endowed with infrastructures than other areas, while sharing with the Northern regions the presence of large urban centers. On the other hand, the Center that is predominantly featured by midsize urban centers, is also characterized by the highest social capital endowments (Putnam (1993)). I find that the partial correlation between city size and internet navigation is positive and statistically significant at the 1-percent level. Clearly, this is evidence against the IKD story. The reported coefficient is the effect of a marginal change in the level of population on the probability of navigating in Internet. Thus, I can compute the impact of city size for an individual that moves, for instance, from Florence (374,501 inhabitants) to Rome (2,281,469 inhabitants). The probability of navigating in Internet increases by 18 percentage points, almost one fourth of the sample mean.

Next, I check to what extent the correlation between city size and Internet navigation is due to observed differences in households' attributes. Following Sinai and Waldfogel (2004), the specification in Column 2 includes the following household level controls: household head age and education; family income and a dummy for the presence of children in the household.[7] In this specification, the estimated coefficient for the level of city population will measure the effect of city size on the likelihood of using the Internet even after accounting for the family characteristics. I find that both family income and the presence of children are strongly correlated to Internet navigation. I also find that education significantly affects navigation: high school diplomats and college graduates are respectively 12% and 17% more likely to navigate in Internet than household heads with an elementary school diploma. Crucially, by controlling for households' attributes the effect of city size on Internet use remains highly significant with a point estimate that decreases only marginally.

Columns 3 and 4 provide some robustness related to the way of measuring city size, the variable of interest. I first replace the specification in level with a specification in logs, which according to Charlot and Duranton (2004) better captures urbanization economies. As shown in the table, the effect of city size remains positive and significant. Next, I replace the population continuous variables with a series of dummy (Small Cities, Midsize Cities, and Large Cities; with Villages representing the omitted category) to check the role of non linearities. I find that the effect of city size is concentrated in the largest cities. When compared to Villages, the positive effect on Internet navigation found for Large Cities is four times the impact found for Midsize Cities.

Subsequently, I consider spatial fixed effects at increasingly finer partitions of the Italian territory. As suggested by Ciccone (2002), the introduction of increasing detailed spatial fixed affects allows to control for spatially correlated omitted variables. Thus, Columns 5 and 6 re-estimate the baseline regression of Column 2 by using, respectively, 20 regions, and 103 provinces geo-controls. Remarkably, the positive effect of city size persists.

[7] I also replaced the dummy for the presence of children in the household with a variables indicating the number of children on the household, with no modification for the results.

Households are not assigned exogenously to cities. Instead, it could be that the positive correlation between city size and Internet usage is generated by "selective migration" of households across cities. In particular, it might happen that households with high (unobserved) propensity to use the web tend to move to more populated areas. In this case, the correlation between Internet use and city size may partially reflect the unobserved propensity to use the web, rather than the true effect of the size of municipality. To make a first assessment of the issue of spatial sorting, I exploit the SHIW data on the birthplace of workers. This information is at the level of the 103 Italian provinces that cover the country.[8] While this is certainly not ideal, I should still be able to detect spatial sorting through the different outcomes for those who work where they were born (the 'stayers') and the others (the 'movers').[9] By interacting our explanatory variables with a dummy variable equal to one for the movers (Column 7), I find that spatial sorting does not seem to be a relevant issue. The effect of the dummy movers on Internet navigation is not statistically different from zero and the interactions between households' characteristics and the dummy for movers is never significant.

So far, our results suggest that, contrary to the IKD hypothesis, there is a positive correlation between city size and Internet navigation. This correlation seems to be robust: it survives after controlling for household characteristics; it does not depend on the way I measure the size; it is not driven by spatially correlated omitted variables; it is not due to spatial sorting. Still, one cannot be sure that this correlation can be interpreted as a causal relation running from city size to Internet use. There might still be some omitted determinants of Internet navigation that might be correlated with the size of the local market: for example, a productivity shocks might have a simultaneous impact on the size of the municipality and the likelihood of using the Internet. This problem can be tackled when I have an instrument for the city size. Such an instrument must account for the observed variation in city size, but not be correlated with the residual of the earning equation. Ciccone (2002) proposes city land area as an instrument for city population on the basis that it is an historically predetermined variable. In Column 8, I present the IV estimation results that we obtain by using city land as an instrument. They suggest that the omitted variable bias is of limited importance for my results. The point estimate for city size decreases modestly from .083 of the benchmark specification of Column 2 to .077, while remaining highly significant.

Overall, the results on Internet navigation provide *strong* evidence against the IKD hypothesis. The relation between city size and the probability of using the internet is increasing, rather than decreasing as the IKD hypothesis would suggest. As for the reasons why the IKD hypothesis does not work, our results could be consistent both with the Gaspar and Glaeser (1998) story, according to which the Internet is a complement to cities because it spurs face-to-face interactions, and the Sinai and Waldfogel (2004) argument, by which the supply of Internet content is biased in favor of urban residents.

3.2 E-commerce

In this section, I consider e-commerce. In the case of online retail spending, the presumption of an advantage for geographically remote consumers seems to be strong, as the alternative offline retail spending requires a trip to the store (Borenstein and Saloner (2001) and Ellison and Ellison (2005). Thus, the farer from the closest offline alternative the higher the likelihood of buying goods and services from the Internet.

[8] Only 2,931 households (out of 3,009) provide this information.
[9] A similar procedure is followed by Charlot and Duranton (2004).

Table 3 reports the probit estimates of the effects of the city size on the probability that an household has bought any goods and services via Internet. The table follows the structure of Table 2. I start by showing in Column 1 the partial correlation between city size and e-commerce, by controlling only for the macro-regions dummies. I find a negative correlation with a low point estimate (-.003), not statistically significant. Controlling for observable differences in household attributes (Column 2), the point estimates goes down to -.013, remain however not different from zero at the usual level of significance. I find that income ad education are strongly correlated with e-commerce, while the presence of children in the household does not matter. Moving to the specification in logs (Column 3) does not change the picture (even though the city size coefficient is now positive), while replacing the population continuous variables with dummies for city size (Column 4) shows, somewhat surprisingly, that, compared to Villages, residents in Midsize and Large Cities no do use e-commerce more intensively while consumers in Small Cities are featured by a less intense online spending activity. The specifications of Columns from 5 to 7 show that the absence of correlation between the use of e-commerce and the size of the city where the household lives is not due to spatially correlated omitted variables or spatial sorting. Finally, Column 8 shows that this result survives when city size is instrumented with city land.

Why does the IKD hypothesis not apply for e-commerce? As underscored by Cairncross (1997), the propensity to shop from the web is a matter not only of cost and convenience, but also of culture and infrastructures. For instance, there could be a lack of knowledge about the possibilities offered by the web as well as a fear of payment or delivery frauds. Moreover, there might be inefficiencies in the parcel-delivery services. These impediments might jeopardize the prospect of e-commerce in remote areas, as a good cultural climate and high-quality support services can be more readily available in urban settings. As pointed out by Borenstein and Saloner (2001), another obstacle is given by the fact that consumers want to physically see and inspect the goods before buying them. When the consumers are not familiar with the products, then it is hard to get real-word information from the Internet. To investigate the relevance of the possible causes for the failure of the IKD hypothesis, in the 2002 wave of the SHIW the following question was posed to those (1,915 households) who did not use e-commerce: "Why didn't you buy any goods and services via Internet?"; the possible answers were recorded as follows: (1) Because I want to see the goods before I buy something; (2) Fear of payment fraud or of not receiving the good purchased; (3) I didn't know it was possible or the service is too complicated; and (4) Delivery charges are too high. The 4 possible answers (with multiple responses allowed) represent the dependent variables for the regression results presented in Table 4. For each possible answer I present the results obtained by using respectively Population, Log of Population, and City Size dummies, as measures of the city population, while the additional controls (not reported in the table) are Age, Children, Income, Education dummies, and 3 Geo-controls (for each potential motive, the three specifications corresponds to the Columns from 2 to 4 of Table 3). Turning to the results, I find that that remote consumers are discouraged by the fact that they cannot see the goods before buying them (Column 1). This motive represents an impediment for e-commerce everywhere but in large cities. Quite unexpected, fear of payment or delivery frauds are a motive that concerns more urban consumers than non-urban counterparts. Finally, no significant impact of city size is found for the motives related respectively to the lack of knowledge and the expensiveness of the delivery services.

The results of Table 4 suggest that e-commerce is going to work best for well-understood standardized products or products where all the relevant information can be transferred easily in digital format. To gain additional insight in this respect, I present in Table 5 regression results on the types of goods e-purchased by the sample of 311 households who did use e-commerce. I broadly find that the IKD hypothesis receives empirical support for leisure

activities and culture goods and services (Column 3). This is consistent with de Blasio (2006), which shows the urban concentration of cultural and leisure activities. Even though they are not statistically significant, I also find that remote consumers purchase (and/or order/book) over the Internet journey and hotels (Column 2) and personal goods and services (Column 6) relatively more than urban consumers. Finally, my results suggest that e-purchasing of foodstuffs (Column 1) is decisively confined to the largest urban areas.

By and large, these results suggest that in e-commerce the IKD hypothesis still faces obstacles mainly because the information relevant for the purchase cannot be transferred easily in the digital formats that the Internet can currently accommodate.

3.2 E-banking

Financial transactions are probably the most important examples of transactions where no physical product is involved. As Cairncross (1997, p. 139) writes: "Financial services need interactivity more than do most other commodities. Buying a case of wine on-line involves merely scanning the details of what is available; the process will always remain more satisfying when it is possible to test first. No such arguments apply to a customer buying stocks or making a payment". Therefore, the impact of distance on e-banking should in principle be large. Even more intensively than for e-commerce, the farer from the closest offline alternative the higher the likelihood of using electronic services. Gains in accessibility (Evanoff, 1988) have been traditionally considered one the major advantage of e-banking. On that basis, in the second half of the nineties market participants forecasted a rapid pace of diffusion (see: Booz-Allen and Hamilton (1996) and Kennickell and Kwast (1997)). As noted by the ECB (1999, p. 14): "Internet banking is expected to have the highest future growth potential (...) it will expand considerably within the next two to three years."

Does the Internet kill the distance in the retail banking sector? I report in Table 6 the empirical evidence on the validity of the IKD hypothesis for a sample of 8,011 households. The table follows the structure previously adopted for Internet navigation and e-commerce. Overall, my results suggest that e-banking bears no relationship with city size. By controlling by nothing than macro-region dummies (Column 1), the partial correlation between city size and the likelihood of using e-banking is not statistically different zero. Adding the household-level controls (Column 2), the point estimate goes further down. Moving to the specification in logs, Column 3 shows a positive (and significant) coefficient of city size. However, Column 4 shows that compared to village residents, residents in Midsize city use e-banking more frequently, but this is not true for Large City dwellers. Allowing for spatial fixed effects at finer partition of the Italian territory (Column 6 and Column 7) would suggest that the presence of spatially correlated omitted variables could have resulted in a downward bias of the effect of city size on e-banking. Literally, this would imply that the IKD hypothesis is strongly rejected, since remoteness would discourage the adoption of e-banking. Finally, the robustness check related to spatial sorting and the instrumental variable estimates confirm the use of e-banking is basically not affected by the size of the city where the household lives.

The above evidence suggests that the IKD hypothesis does not hold: e-banking does not substitute for more tradition services delivered at branches. This is consistent with JP Morgan (2000) and BIS (2003), which suggest that e-banking is mainly perceived as an additional for traditional banking services, a complement rather than a substitute. On related grounds, the supply of Internet services is limited. As underscored by Bonaccorsi di Patti et al (2005) and ECB (2002), the financial services offered electronically only represent a subset of the services available at a branch. In

particular, payment and asset management services are commonly offered on the web, while loans are not supplied. What does explain the failure of the IKD hypothesis in retail banking? A possible reason is soft information in lending. As underscored by Berger and Udell (1995) and Petersen and Rajan (1994), information about families and small family business is thought to be "soft", whereby hard information is defined (see: Petersen (2004)) as quantitative, easy to store and transmit in an impersonal ways. As noted by Petersen and Rajan (2002), lending practices based on soft information require the lender to have personal contacts with the borrower, and this can be guaranteed by the lender local presence (moreover, since the information is soft and difficult to communicate, the decision to offer the credit has to be made very close to where the information is gathered). On related grounds, Berlin and Mester (1999) and Kashyap et al (2002) highlight that the information generated by a deposit account may increase the probability of obtaining good terms on loans. Finally, according to Berger et al (1996), one-stop banking (consuming the all bundle of financial services from the same bank) brings substantial benefits (scope economies) to consumers.

To shed some light on the reason behind the failure of the IKD hypothesis in retail banking, I perform two additional experiments.[10]

I study the relation between city size and the financial products and services supplied with a deposit account. I exploit the following question, posed to 3,542 households (the question was only posed to household with an head with an even year of birth): "In addition to your account, what other financial products/services does your (main) bank supply you with". I group the possible answers in four categories. 1) Basic banking account, which includes ordinary payment services, such as payment of utility bills and crediting of salary. 2) Deposit accounts supplied with asset management services. This category includes security custody and administration, security trading, insurance policies, and individual portfolio management. 3) Banking account supplied with a loan, either mortgage loans, consumer credit or personal loans. 4) Online services, which includes both interactive services and informational services. The 4 possible answers (with multiple responses allowed) represent the dependent variables for the regression results presented in Table 7. For each possible answer I present the results obtained by using respectively Population, Log of Population, and City Size dummies, as measures of the city population, while the additional controls (not reported in the table) are Age, Children, Income, Education dummies, and 3 Geo-controls (for each potential motive, the three specifications corresponds to the Columns from 2 to 4 of Table 6). As for the findings, there is strong evidence that remote banking holders are supplied with a bank loan more frequently than their urban counterparts. The effect of city size on the on the probability of having a loan from the same bank in which a consumer has opened a banking account (Column 3) is negative, highly significant and independent from the way the size of the city is measured. I also find that having asset management services (Column 2) is negatively correlated with city size, even though the coefficients are not statistically significant at the usual levels. In sum, having a deposit account with the same bank that supplies the loan (and perhaps that provides asset management services) benefits more remote households than their urban counterparts. In principle, these findings could be consistent both with the soft information story and the one-stop economies interpretation.

[10] Unfortunately, to investigate the relevance of the IKD hypothesis in e-banking the SHIW questionnaire does not offer the same possibilities as it does for e-commerce. In particular, it could have been valuable to ask e-banking users on what kind of services they actually use and e-banking non-users on the reasons why they prefer tradition branches.

To make an additional step in trying to identify the reasons behind the failure of the IKD hypothesis I use information on the household's revealed preference for choosing their bank. For instance, the appeal of the soft-information interpretation relies on the role of face-to-face interactions. From the borrower's point of view, moving to another bank (or even a change in the lending officer within the same bank!) might be very costly. On the other hand, the one-stop economies story should imply some efficiency gains that accrue to the consumer, such as convenient interest rates or low charges for services, or, even without better prices, a preference for the variety of services offered at the same place. Table 8 provide a test for this argument. I make use of a question posed to the heads of household (with an even year of birth) regarding the reasons for choosing the bank ("What made you prefer your (main) bank when you and your household began to use it?"). The possible answers are recorded as follows: (1) Distance (phrased as it is convenient with respect to both home and workplace); (2) Efficiency (it includes: advantageous interest rates, advantageous charges for services, rapidity of banking transactions, courteousness of the staff, quantity and variety of services offered); (3) Personal acquaintances; (4) Bank standing (phrased as it is a famous, important bank); (5) Other reasons (it includes: it is the bank of my employer, it offers services that permit banking transactions to be carried out over the Internet, don't know, no particular reason). Turning to the results, I find that personal acquaintances (Column 3) represent a reason for choosing the family bank that is inversely correlated with city size. In choosing a bank, non-urban customers evaluate personal acquaintances as an important factor more intensively than urban clients. This effect is highly significant and survives to alternative measures of the city size. In contrast, I fail to find that bank efficiency (Column 2) is negatively correlated with distance. My results also suggests that having a bank branch close to home or the workplace (Column 1) is a determinant of the household's choice that is less relevant in larger areas. This effect however is insignificant. Finally, I find that compared to non urban customer, remote households evaluate the bank standing (Column 4) more (again, these effects are not statistically significant at the usual levels).

On balance, my results documents that the IKD hypothesis is far from being realized in the retail banking sector. As far the reasons for this failure, the evidence suggest that soft information in lending could be key. Banking account holders in remote areas are more frequently supplied with a loan by their bank. Moreover, in choosing that bank personal acquaintances have been considered a key factor.

4. Conclusions

The popular view is that the Internet is about to hugely transform the economy. By creating neighborhoods connected not with streams and roads but with wires and microwaves transmission, it is expected to generate a revolution in the economic geography. In short, the Internet might serve as a substitute for urban agglomeration. This paper assesses this hypothesis by using Italian household level data on internet navigation, e-commerce, and e-banking.

Overall, the paper finds that the potential for the Internet to substitute for cities appears to be limited. First, Internet navigation is more frequent for urban consumers than their non-urban counterparts. Second, the use of e-commerce is basically not affected by the size of the city where the household lives. Third, E-banking bears no relationship with city size.

While these results document that the death of distance prophecy is far from being realized, I have also provided an attempt to unravel the reasons why the prophecy fails. As for E-commerce, remote consumers are discouraged by the fact that they cannot see the goods before buying them. Leisure activities and cultural items are the only goods and services for which e-commerce is used more intensively in isolated areas. As for E-banking, in choosing a bank, non-urban customers evaluate personal acquaintances as an important factor more intensively than urban clients. This also depends on the fact that banking account holders in remote areas are more frequently supplied with a loan by their bank.

A note of caution is however in order. These results refer to 2002, that is a few years after the diffusion of the Internet-related possibilities. It is worth noting that innovations of all kinds tend to arise first and diffuse faster in larger cities. That is, the likelihood of learning about a new technology is higher in larger cities. In short, the results presented in the paper could be a short-term correction, rather then a long-term adjustment. While the evidence presented in this paper does not lend support for this interpretation, the changes underway should not be underestimated. On the one hand, consumers' disaffection with Internet-provided information could also spur additional adjustments in distribution. For instance, Borenstein and Saloner (2001) conjecture that show-room facilities, which might lessen the difficulties related the absence of real-word information, are likely to develop. On the other hand, soft information in lending might become less relevant. As forecasted by Petersen and Rajan (2002), there could be a shift from soft to hard information as a basis for lending activities. In particular, since new technology permits more (hard) information to be gathered, stored and distributed, lenders could be increasingly less in need of the rich soft information they are currently using.

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Table 1. Summary Statistics

Variable	Mean	Standard deviation	Observations
Internet Navigation	0.75	0.43	3,009
E-commerce	0.15	0.35	2,260
E-banking	0.05	0.45	8,011
Pop (mil.)	0.15	0.36	8,011
Log Pop	-3.35	1.73	8,011
Land	114.40	164.97	8,011
Villages	0.29	0.45	8,011
Small City	0.18	0.39	8,011
Midsize City	0.44	0.50	8,011
Large City	0.08	0.28	8,011
North	0.46	0.50	8,011
Center	0.21	0.41	8,011
South and Islands	0.33	0.47	8,011
Age	56.75	15.58	8,011
Children	0.51	0.50	8,011
Income	28.23	22.22	8,011
Elementary school	0.38	0.49	8,011
Junior High School	0.27	0.44	8,011
High School	0.27	0.44	8,011
College & More	0.08	0.27	8,011
Movers	0.23	0.42	8,011

Notes: The description of the variables is in the Appendix.

Table 2. City Size and Internet Navigation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
							No interaction	Interaction with Dummy for Movers	
Pop (mil.)	.094***	.083***			.089***	.103***	.096***	.035	.077***
	(.015)	*(.025)*			*(.027)*	*(.020)*	*(.033)*	*(.035)*	*(.031)*
Log Pop			.047***						
			(.029)						
i. Small City				.080					
				(.100)					
ii. Midsize City				.094					
				(.089)					
iii. Large City				.332					
				(.226)					
Age (×100)		-.008	-.048	-.036	-.015	-.035	.020	-.025	.035
		(.116)	*(.392)*	*(.388)*	*(.113)*	*(.115)*	*(.130)*	*(.199)*	*(.113)*
Children		.049**	.145**	.140*	.054**	.055**	.049	.023	.050**
		(.023)	*(.074)*	*(.073)*	*(.023)*	*(.024)*	*(.032)*	*(.053)*	*(.022)*
Income		.003***	.011***	.011***	.003***	.004***	.003***	-.001	.002***
		(.001)	*(.002)*	*(.002)*	(.001)	*(.000)*	*(.001)*	*(.001)*	*(.000)*
i. Junior High School		.007	.024	.026	.008	.003	.040	-.085	.009
		(.035)	*(.119)*	*(.119)*	*(.035)*	*(.036)*	*(.040)*	*(.086)*	*(.043)*
ii. High School		.123***	.405***	*.410****	.125***	.118***	.141***	.058	.142***
		(.032)	*(.117)*	*(.115)*	*(.032)*	*(.032)*	*(.039)*	*(.083)*	*(.038)*
iii. College & More		.168***	.704***	.705***	.173***	.168***	.181***	.030	.203***
		(.031)	*(.168)*	*(.166)*	*(.030)*	*(.030)*	*(.029)*	*(.090)*	*(.048)*
Dummy for Movers							.014		
							(.128)		
Geo-Controls	3	3	3	3	20	103	3		3
Estimation Method	LS	LS	LS	LS	LS	LS	LS		IV
Observations	3,009	3,009	3,009	3,009	3,009	2,960	2,931		3,009

Notes: The dependent variable is an indicator variable taking value one if a household responds positively to the following question: "Does any member of your household, at home or elsewhere, navigate in Internet?". For a description of all the other variables see the Appendix. For all columns except (8) the reported coefficients are probit estimates of the effect of a marginal change in the corresponding regressor on the probability of navigating in Internet, computed at the sample mean of the independent variables. The coefficient reported in column (8) are from IV, with the city land as instrument. Regressions are weighted to population proportions. Robust standard errors in parentheses (clustered on city). *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 3. City Size and E-Commerce

	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
							No interaction	Interaction with Dummy for Movers	
Pop (mil.)	-.003	-.013			.010	.037	-.010	.010	.029
	(.031)	*(.024)*			*(.030)*	*(.022)*	*(.027)*	*(.014)*	*(.039)*
Log Pop			.001						
			(.007)						
i. Small City				-.043*					
				(.025)					
ii. Midsize City				.016					
				(.025)					
iii. Large City				.003					
				(.053)					
Age (×100)		-.197**	-.203**	-.198**	-.197**	-208**	.-.259***	.220	-.214**
		(.085)	*(.086)*	*(.086)*	*(.083)*	*(.093)*	*(.089)*	*(.195)*	*(.087)*
Children		-.004	.000	.002	-.000	-.000	.005	-.045	-.012
		(.019)	*(.018)*	*(.019)*	*(.019)*	*(.020)*	*(.028)*	*(.056)*	*(.023)*
Income		.001***	.001***	*.001****	.001***	*.001***	*.001*	*.001*	*.001***
		(.000)	*(.000)*	*(.000)*	*(.000)*	*(.000)*	*(.000)*	*(.001)*	*(.001)*
i. Junior High School		.034	.033	*.031*	.035	*.052*	*.028*	*.001*	*.008*
		(.039)	*(.039)*	*(.039)*	*(.038)*	*(.043)*	*(.048)*	*(.089)*	*(.023)*
ii. High School		.116***	.114***	*.112****	.108***	*.137****	*.103***	*.017*	*.082****
		(.034)	*(.034)*	*(.034)*	*(.034)*	*(.035)*	*(.042)*	*(.085)*	*(.022)*
iii. College & More		.168***	.160***	.155***	.157***	.200***	.141***	.031	.109**
		(.054)	*(.052)*	*(.052)*	*(.052)*	*(.058)*	*(.064)*	*(.098)*	*(.032)*
Dummy for Movers							-.107		
							(.095)		
Geo-Controls	3	3	3	3	20	103	3		3
Estimation Method	LS	LS	LS	LS	LS	LS	LS		IV
Observations	2,260	2,260	2,260	2,260	2,246	2,063	2,205		2,260

Notes: The dependent variable is an indicator variable taking value one if a household responds positively to the following question: "During 2002, have you bought any goods and services via Internet?". For a description of all the other variables see the Appendix. For all columns except (8) the reported coefficients are probit estimates of the effect of a marginal change in the corresponding regressor on the probability of using e-commerce, computed at the sample mean of the independent variables. The coefficient reported in column (8) are from IV, with the city land as instrument. Regressions are weighted to population proportions. Robust standard errors in parentheses (clustered on city). *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 4. City Size and Obstacles to E-commerce

Dependent variables:	(1) I want to see the goods before I buy something	(2) Fear of payment fraud or of not receiving the good purchased	(3) I didn't know it was possible or the service is too complicated	(4) Delivery charges are too high
Pop (mil.)	-.105***	.093***	-.033	.004
	(.019)	*(.019)*	*(.025)*	*(.004)*
Log Pop	-.027***	.030***	-.005	-.001
	(.009)	*(.008)*	*(.006)*	*(.002)*
i. Small City	.036	.003	-.014	-.014
	(.054)	*(.051)*	*(.024)*	*(.010)*
ii. Midsize City	-.025	.058	-.005	-.016
	(.046)	*(.041)*	*(.023)*	*(.010)*
iii. Large City	-.186***	185***	-.011	-.003
	(.053)	*(.042)*	*(.044)*	*(.011)*

Notes: Households who do not use e-commerce are asked to respond to the following question: "Why didn't you buy any goods and services via Internet?". The possible answers, which represent the dependent variables in Table 4, are recorded as follows: (1) Because I want to see the goods before I buy something; (2) Fear of payment fraud or of not receiving the good purchased; (3) I didn't know it was possible or the service is too complicated; and (4) Delivery charges are too high. Multiple responses are allowed. Each dependent variable takes on the value of one if a household indicates that reason (among others) as an obstacle to the use of e-commerce. Each entry in Table 4 represents the coefficient for the city size measure obtained by running a separate regression (as, respectively, in (3.2), (3.3), and (3.4)). Additional controls (not reported in the Table 4) are Age, Children, Income, Education dummies, 3 Geo-controls. Estimation method is LS. The number of observations is equal to 1,915. For all entries, the reported coefficients are probit estimates of the effect of a marginal change in the corresponding regressor on the probability of indicating the corresponding reason as an obstacle to e-commerce, computed at the sample mean of the independent variables. Regressions are weighted to population proportions. Robust standard errors in parentheses (clustered on city). *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 5. City Size and Types of Goods E-purchased

Dependent variables:	(1) Foodstuffs	(2) Journey and hotels	(3) Leisure activities and culture	(4) Computer and high tech products	(5) Households goods and services	(6) Personal goods and services
Pop (mil.)	.053***	-.022	-.104**	-.067	.018	-.042
	(.022)	*(.030)*	*(.044)*	*(.065)*	*(.042)*	*(.050)*
Log Pop	.019***	-.017	-.026*	.016	-.003	-.021
	(.005)	*(.015)*	*(.014)*	*(.016)*	*(.013)*	*(.014)*
i. Small City	.059	.097	-.078	.123	.025	-.072
	(.069)	*(.102)*	*(.086)*	*(.095)*	*(.065)*	*(.068)*
ii. Midsize City	.059	-.106	-.058	.145	.049	-.055
	(.042)	*(.079)*	*(.077)*	*(.074)*	*(.054)*	*(.063)*
iii. Large City	.192***	-.068	-.154*	-007	-.014	-.119*
	(.088)	*(.072)*	*(.082)*	*(.01.0)*	*(.072)*	*(.061)*

Notes: Households who do use e-commerce are asked to respond to the following question: "Which of the following purchases (and/or orders/bookings) did you make over the Internet?". The possible answers, which represent the dependent variables in Table 5, are recorded as follows: (1) Foodstuffs; (2) Journey and hotels; (3) Leisure activities and culture; (4) Computer and high tech products; (5) Households goods and services; and (6) Personal goods and services. Multiple responses are allowed. Each dependent variable takes on the value of one if a household indicates that type of goods (among others) as purchased (and/or ordered/booked) by e-commerce. Each entry in Table 5 represents the coefficient for the city size measure obtained by running a separate regression (as, respectively, in (3.2), (3.3), and (3.4)). Additional controls (not reported in the Table 5) are Age, Children, Income, Education dummies, 3 Geo-controls. Estimation method is LS. The number of observations is equal to 311. For all entries, the reported coefficients are probit estimates of the effect of a marginal change in the corresponding regressor on the probability of indicating the corresponding type of goods as e-purchased, computed at the sample mean of the independent variables. Regressions are weighted to population proportions. Robust standard errors in parentheses (clustered on city). *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 6. City Size and E-Banking

	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
							No interaction	Interaction with Dummy for Movers	
Pop (mil.)	.006	.001			.009***	.011***	.003	-.003	.004
	(.007)	*(.002)*			*(.003)*	*(.004)*	*(.003)*	*(.004)*	*(.006)*
Log Pop			.002**						
			(.001)						
i. Small City				-.003					
				(.006)					
ii. Midsize City				.014***					
				(.006)					
iii. Large City				.007					
				(.006)					
Age		-.068***	-.068***	-.066***	-.066***	-.064***	-.079***	.000	-.100***
		(.012)	*(.012)*	*(.012)*	*(.012)*	*(.011)*	*(.013)*	*(.000)*	*(.021)*
Children		.010***	.011***	.011***	.009***	.010***	.012***	-.006	.004
		(.003)	*(.004)*	*(.004)*	*(.003)*	*(.004)*	*(.004)*	*(.006)*	*(.007)*
Income		.000***	.000***	.000***	.000***	.000***	.000***	-.000	.001***
		(.000)	*(.000)*	*(.000)*	*(.000)*	*(.000)*	*(.000)*	*(.000)*	*(.000)*
i. Junior High School		-.003	-.003	*-.003*	*-.004*	*-.003*	*-.004*	*.001*	*-.021***
		(.007)	*(.006)*	*(.006)*	*(.006)*	*(.007)*	*(.008)*	*(.014)*	*(.006)*
ii. High School		.042***	.039***	*.039***	*.039***	*.046***	*.048***	*-.013*	*.040*
		(.009)	*(.008)*	*(.008)*	*(.008)*	*(.009)*	*(.012)*	*(.006)*	*(.007)*
iii. College & More		.080***	.068***	.069***	.069***	.084***	.073***	.003	.070
		(.022)	*(.020)*	*(.020)*	*(.020)*	*(.025)*	*(.024)*	*(.013)*	*(.018)*
Dummy for Movers							.004		
							(.009)		
Geo-Controls	3	3	3	3	20	103	3		3
Estimation Method	LS	LS	LS	LS	LS	LS	LS		IV
Observations	8,011	8,011	8,011	8,011	7,701	7,041	7,756		8,011

Notes: The dependent variable is an indicator variable taking value one if a household responds positively to the following question: "During 2002, did you or another member of the household use Internet links with banks or financial intermediaries?". For a description of all the other variables see the Appendix. For all columns except (8) the reported coefficients are probit estimates of the effect of a marginal change in the corresponding regressor on the probability of using e-banking, computed at the sample mean of the independent variables. The coefficient reported in column (8) are from IV, with the city land as instrument. Regressions are weighted to population proportions. Robust standard errors in parentheses (clustered on city). *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 7. City Size and Household's Financial Products/Services Subscribed

Dependent variables:	(1) Basic	(2) Asset Management	(3) Loans	(4) Online Services
Pop (mil.)	.005	-.015	-.059***	.001
	(.008)	*(.010)*	*(.019)*	*(.001)*
Log Pop	-.002	-.000	-.007*	.001
	(.003)	*(.004)*	*(.004)*	*(.001)*
i. Small City	-.007	.006	-.028	.004
	(.018)	*(.024)*	*(.016)*	*(.005)*
ii. Midsize City	-.017	-.000	-.005	.011**
	(.011)	*(.020)*	*(.014)*	*(.006)*
iii. Large City	-.008	-.011	-.056**	.005
	(.022)	*(.027)*	*(.019)*	*(.005)*

Notes: A fraction of the households (only those with the head of household's year of birth even) with a banking account is asked to respond to the following question: "In addition to your account, what other financial products/services does your (main) bank supply you with". The possible answers, which represent the dependent variables in Table 7, are recorded as follows: (1) Basic (it includes: no additional financial product/service, payment of utility bills, and crediting of salary); (2) Asset Management (it includes: security custody and administration, security trading, insurance policies, and individual portfolio management); (3) Loans (it includes: mortgage loans, consumer credit and personal loans); (4) Online services (it includes: interactive online services and informational online services). Each dependent variable takes on the value of one if a household indicates that type of financial products/services subscribed as supplied by the bank in addition to a checking/deposit account. Each entry in Table 7 represents the coefficient for the city size measure obtained by running a separate regression (as, respectively, in (6.2), (6.3), and (6.4)). Additional controls (not reported in the Table 7) are Age, Children, Income, Education dummies, 3 Geo-controls. Estimation method is LS. The number of observations is equal to 3,542. For all entries, the reported coefficients are probit estimates of the effect of a marginal change in the corresponding regressor on the probability of indicating the corresponding financial products/services as supplied by the (main) bank , computed at the sample mean of the independent variables. Regressions are weighted to population proportions. Robust standard errors in parentheses (clustered on city). *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 8. City Size and Household's Preference for Choosing a Bank

Dependent variables:	(1) Distance	(2) Efficiency	(3) Personal acquaintances	(4) Bank standing	(5) Other reasons
Pop (mil.)	-.022	.034*	-.039***	-.012*	-.001
	(.015)	*(.019)*	*(.012)*	*(.000)*	*(.027)*
Log Pop	-.008	.009	-.007*	-.001	.008
	(.007)	*(.006)*	*(.004)*	*(.001)*	*(.006)*
i. Small City	-.020	.006	.032	.014	.016
	(.049)	*(.035)*	*(.026)*	*(.011)*	*(.032)*
ii. Midsize City	-.031	.012	.016	.005	.043
	(.037)	*(.029)*	*(.021)*	*(.007)*	*(.026)*
iii. Large City	-.028	.034	-.056***	-.005	.058
	(.042)	*(.047)*	*(.018)*	*(.008)*	*(.045)*

Notes: A fraction of the households (only those with the head of household's year of birth even) with a banking account is asked to respond to the following question: "What made you prefer your (main) bank when you and your household began to use it?". The possible answers, which represent the dependent variables in Table 8, are recorded as follows: (1) Distance (phrased as it is convenient with respect to both home and workplace); (2) Efficiency (it includes: advantageous interest rates, advantageous charges for services, rapidity of banking transactions, courteousness of the staff, quantity and variety of services offered); (3) Personal acquaintances; (4) Bank standing (phrased as it is a famous, important bank); (5) Other reasons (it includes: it is the bank of my employer, it offers services that permit banking transactions to be carried out over the Internet, don't know, no particular reason). Each dependent variable takes on the value of one if a household indicates that type of motive as a reason for choosing the bank. Each entry in Table 7 represents the coefficient for the city size measure obtained by running a separate regression (as, respectively, in (6.2), (6.3), and (6.4)). Additional controls (not reported in the Table 8) are Age, Children, Income, Education dummies, 3 Geo-controls. Estimation method is LS. The number of observations is equal to 3,535. For all entries, the reported coefficients are probit estimates of the effect of a marginal change in the corresponding regressor on the probability of indicating the corresponding motive as reason for choosing the bank, computed at the sample mean of the independent variables. Regressions are weighted to population proportions. Robust standard errors in parentheses (clustered on city). *significant at 10%, ** significant at 5%, *** significant at 1%.

Appendix . Description of the variables

Variable	Description
Internet Navigation	Indicator variable taking value one if a household responds positively to the following question: "Does any member of your household, at home or elsewhere, navigate in Internet?"
E-commerce	Indicator variable taking value one if a household responds positively to the following question: "During 2002, have you bought any goods and services via Internet?"
Obstacles to e-commerce	Indicator variables taking value of one if a household indicates the corresponding reason (among others) as an obstacle to the use of e-commerce. Households who do not use e-commerce are asked to respond to the following question: "Why didn't you buy any goods and services via Internet?". The possible answers are recorded as follows: (1) Because I want to see the goods before I buy something; (2) Fear of payment fraud or of not receiving the good purchased; (3) I didn't know it was possible or the service is too complicated; and (4) Delivery charges are too high. Multiple responses are allowed.
Types of goods e-purchased.	Indicator variables taking value of one if a household indicates the corresponding type of goods (among others) as purchased (and/or ordered/booked) by e-commerce Households who do use e-commerce are asked to respond to the following question: "Which of the following purchases (and/or orders/bookings) did you make over the Internet?". The possible answers are recorded as follows: (1) Foodstuffs; (2) Journey and hotels; (3) Leisure activities and culture; (4) Computer and high tech products; (5) Households goods and services; and (6) Personal goods and services. Multiple responses are allowed.
E-banking	Indicator variable taking value one if a household responds positively to the following question: "During 2002, did you or another member of the household use Internet links with banks or financial intermediaries?"
Household's Financial Products/Services Subscribed	Indicator variable taking value of one if a household indicates the corresponding type of financial products/services subscribed as supplied by the bank in addition to a checking/deposit account. A fraction of the households (only those with the head of household's year of birth even) with a banking account is asked to respond to the following question: "In addition to your account, what other financial products/services does your (main) bank supply you with". The possible answers are recorded as follows: (1) Basic (it includes: no additional financial product/service, payment of utility bills, and crediting of salary); (2) Asset Management (it includes: security custody and administration, security trading, insurance policies, and individual portfolio management); (3) Loans (it includes: mortgage loans, consumer credit and personal loans); (4) Online services (it includes: interactive online services and informational online services).
Household's Preference for Choosing a Bank	Indicator variable taking value of one if a household indicates the corresponding motive as a reason for choosing the bank. A fraction of the households (only those with the head of household's year of birth even) with a banking account is asked to respond to the following question: "What made you prefer your (main) bank when you and your household began to use it?". The possible answers, which represent the dependent variables in Table 8, are recorded as follows: (1) Distance (phrased as it is convenient with respect to both home and workplace); (2) Efficiency (it includes: advantageous interest rates, advantageous charges for services, rapidity of banking transactions, courteousness of the staff, quantity and variety of services offered); (3) Personal acquaintances; (4) Bank standing (phrased as it is a famous, important bank); (5) Other reasons (it includes: it is the bank of my employer, it offers services that permit banking transactions to be carried out over the Internet, don't know, no particular reason).
Pop (mil.)	Population (in millions of inhabitants) of the municipality where the household lives (source: ISTAT).
Log Pop	Log of the city population (source: ISTAT).
Land	Squared kilometers of the municipality (source: ISTAT)
Villages	Indicator variable taking value of one if a household lives in a municipality with less than 20,000 inhabitants.
Small City	Indicator variable taking value of one if a household lives in a municipality with more than 20,000 and less than 40,000 inhabitants.
Midsize City	Indicator variable taking value of one if a household lives in a municipality with more than 40,000 and less than 500,000 inhabitants.
Large City	Indicator variable taking value of one if a household lives in a municipality with more than 500,000 inhabitants.

Appendix (cont.) Description of the variables

Variable	Description
North	Indicator variable taking value of one if a household lives in the Northern regions.
Center	Indicator variable taking value of one if a household lives in the Center regions.
South and Islands	Indicator variable taking value of one if a household lives in the South or Islands.
Age	Household head's age at the survey date
Children	Indicator variable taking value of one if there are children in the household.
Income	Net disposable income of the household.
Elementary school	Indicator variable taking value of one if the highest educational qualification earned by the household head is elementary school.
Junior High School	Indicator variable taking value of one if the highest educational qualification earned by the household head is junior high school.
High School	Indicator variable taking value of one if the highest educational qualification earned by the household head is high school.
College & More	Indicator variable taking value of one if the highest educational qualification earned by the household head is a bachelor's degree or postgraduate qualification.
Movers	Indicator variable taking the value of one for individuals residing in a province different from that of birth.